



*Environmental Reporting and Disclosure Bylaw
(Municipal Code Chapter 423)*

Guide to Reporting

Version 4
January 2013



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Please note that this version replaces all previous versions.
Check www.toronto.ca/chemtrac for updates and other program resources

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Distribution: This document and other chemtrac resources are available at: www.toronto.ca/chemtrac

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Table of Contents

1.0 Introduction	4
1.1 Definition of terms.....	4
2.0 Do I need to report?	6
2.1 Why report?.....	7
2.2 Reporting timelines.....	7
3.0 Reportable Priority Substances	9
3.1 What are the reporting thresholds?.....	10
3.2 What are chemical groups?	10
3.3 How do I know if I manufacture, use or release any priority substances?	11
4.0 Reporting criteria.....	13
4.1 Exempt facilities and businesses	13
4.2 Exempt sources of chemicals	13
5.0 Estimating amounts released, manufactured, processed and otherwise used.....	15
6.0 What information do I report?	16
6.1 Facility information.....	16
6.2 Priority Substances information	16
6.3 Additional information	17
7.0 How to Report	17
7.1 Reporting Checklist	17
7.2 Reporting Online	19
Step 1: Facility Registration	20
Step 2: Reporting Period	21
Step 3: Chemical Selection.....	22
Step 4: Chemical Use and Release	23
Step 5: Environmental Statement	24
Step 6: Summary Notification	25
Step 7: ChemTRAC Report	25
Appendix 1: Types of facilities exempt from reporting.....	27
Appendix 2: Exempt sources of priority substances	29
Appendix 3: Polycyclic Aromatic Hydrocarbons (PAHs)	31
Appendix 4: Volatile Organic Compounds (VOCs)	32
Appendix 5: Methods of Estimation	36
A5.1 Continuous Emission Monitoring Systems.....	36
A5.2 Predictive Emission Monitoring	37
A5.3 Source Testing.....	38
A5.4 Mass Balance Calculations	40
A5.5 Site-specific and Published Emission Factors	41
A5.6 Engineering Estimates	43
A5.7 Sources of Information	44
Appendix 6: Examples of how to report a priority substance.....	45

1.0 Introduction

ChemTRAC is a program in Toronto that aims to improve public health and to make businesses greener by reducing the use and release of toxic chemicals. Part of this program is the Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423) which mandates some industries to report the use and releases of 25 toxic chemicals.

This guide can help you determine if the bylaw applies to your facility or business and how to report if it does. We recommend that you also review the Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423) online at http://www.toronto.ca/legdocs/municode/1184_423.pdf.

How to use this guide

This guide is for owners and operators of businesses and facilities in Toronto.

- Sections 1 - 4 follow the steps that you may go through to find out if your facility or business needs to report.
- Sections 5 – 6 provide the information you will need once you know you are required to report.
- Section 7 guides you through the online reporting system to submit data on amounts of priority substances released, manufactured, processed and otherwise used in your facility.
- Appendices give detailed examples and explanations.

This guide is one in a series of ChemTRAC resources to help you. You can find more information and resource guides at www.toronto.ca/chemtrac.

1.1 Definition of terms

The defined terms below are used in the bylaw and guide.

Facility: A facility is a building, equipment, structure, and other stationary items that are located on a single site or on contiguous or adjacent sites and that are owned and are operated by the same person, or by a person who controls, is controlled by, or is under common control with such person, but does not include a dwelling unit.

Manufacture: To produce, prepare or compound a priority substance. This includes the coincidental production of a priority substance as a by-product. For example:

- Natural gas boilers, that are used to heat a process, can emit substances such as Nitrogen Oxides (NO_x), Particulate Matter 2.5 (PM_{2.5}) and Volatile Organic Compounds (VOCs). These substances are considered “manufactured” because they are coincidentally produced as a by-product.

Priority Substance: This is a toxic chemical or substance of concern, with known adverse health effects and is listed in the Environmental Reporting and Disclosure Bylaw (Figure 3.1, p. 9). In this guide we use the term "chemical" interchangeably with priority substance.

Process: The preparation of a priority substance, after its manufacture, for commercial distribution. This includes the preparation of a substance in the same physical state or chemical form as that received by the facility, or preparation which produces a change in physical state or chemical form.

- The use of manganese to manufacture welding rod is an example of processing manganese.
- The use of toluene and xylene to blend paint solvent mixtures is an example of processing VOCs (toluene and xylene) without changes in chemical form.

Release: The emission or discharge of a priority substance, whether intentional or accidental, from the facility into the environment.

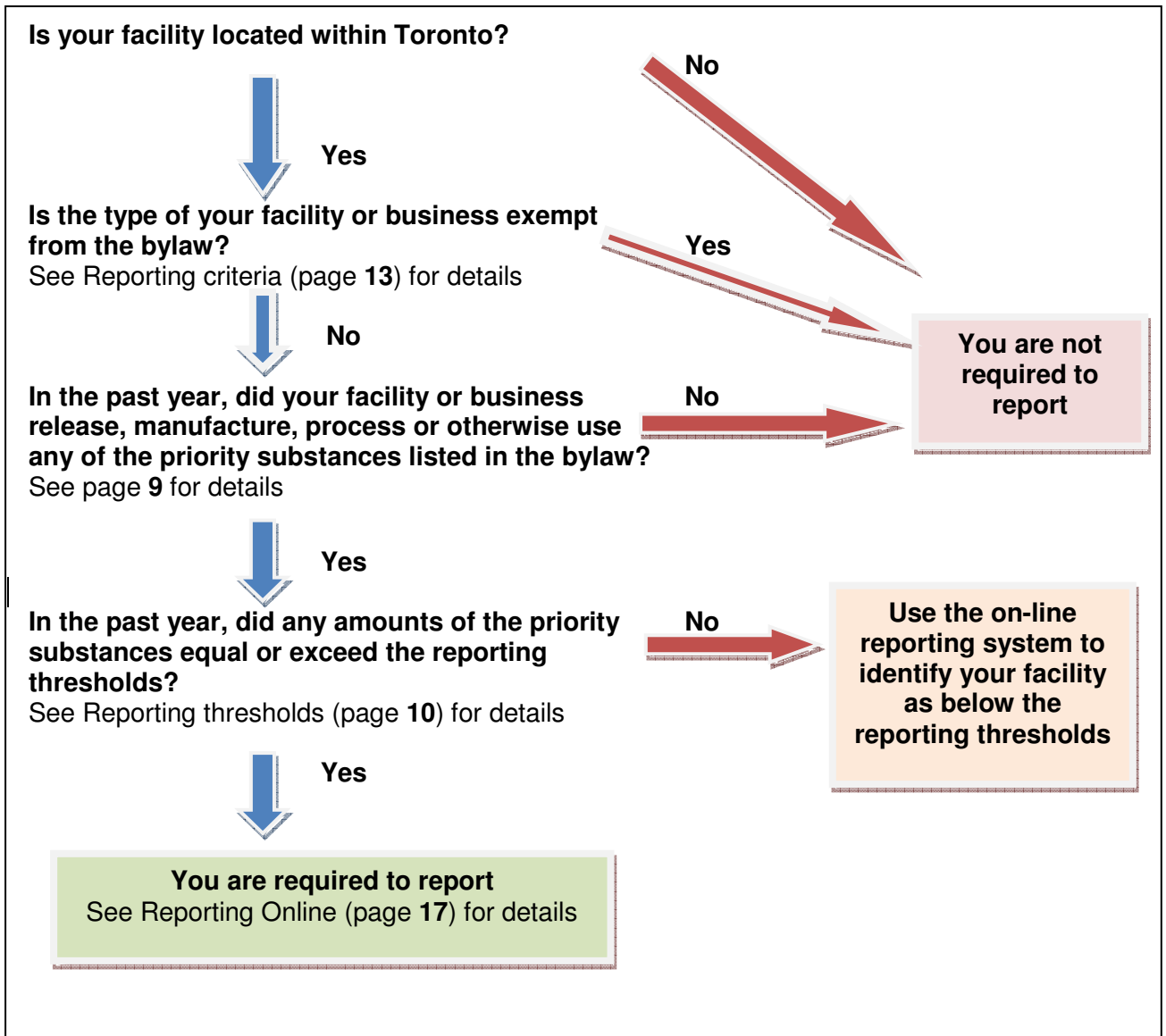
Other Use: Any use, disposal or release of a priority substance at a facility that does not fall under the definitions of “manufacture” or “process”. This includes the use of the priority substance as a chemical processing aid, manufacturing aid or some other use.

- Examples of this are solvents such as trichloroethylene, used for cleaning process equipment.

2.0 Do I need to report?

If your facility or business is in Toronto you may have to submit a report to comply with the Environmental Reporting and Disclosure Bylaw. Please note that reporting is done every year. The amounts of chemicals your facility releases, manufactures, processes or otherwise uses may change from year to year. Therefore, some years you may not meet the reporting thresholds, which means you would not have to report for those years. It is important to check every year if you need to report or not. Figure 2.1 (below) will help you determine if your facility needs to report.

Figure 2.1: Steps to check if you need to report



2.1 Why report?

There are thousands of facilities in Toronto that release, manufacture, process or otherwise use small amounts of toxic chemicals. Even though the individual amounts may seem small, they can add up in our environment to levels that may affect health. Our first step to protect the health of our community is to track 25 priority substances that have been found to be present in Toronto's environment and have known adverse health effects. Then, this information can be used to take actions to reduce the use and release of these substances by our local businesses. In addition to the environmental reporting, ChemTRAC includes the promotion of greening solutions, such as pollution prevention, to Toronto businesses.

Toxic reduction and reporting programs are found all over the world and have been developed by all levels of government. Canada's largest and longest-running reporting program is the [National Pollutant Reporting Inventory](#) (NPRI). It requires large facilities to report on their emissions of certain chemicals. Ontario also has a [Toxics Reduction Act](#), which targets the same facilities as the NPRI.

An important part of ChemTRAC is the Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423), passed by City Council in December 2008. The bylaw was developed through an extensive consultation and research process. Toronto Public Health examined chemicals present in the community, compiled best practices from other toxic reduction programs and consulted with businesses, residents and community organizations. ChemTRAC and the bylaw were developed based on these findings, to make a program tailored to the needs of facilities and residents in Toronto.

2.2 Reporting timelines

The Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423) came into effect January 1, 2010 and reporting was phased in over the following three years. As shown in Figure 2.2, facilities in Phase 1 and Phase 2 were required to begin reporting in 2011 and 2012, respectively. Facilities in Phase 3 begin reporting in 2013.

If your facility meets the reporting requirements you are required to report your data every year by June 30 for the previous year's data.

Figure 2.2: Phases for reporting

Phase 1 Facilities

→ These facilities first reported in 2011 for their data collected in 2010. They must continue to report their data every year by June 30 for the previous year's data.

Phase 1 Facilities by Industrial Sector	NAICS code ¹
Manufacturing, including chemical and petroleum products	324 to 326
Food and beverage manufacturing, tobacco products	3111 to 3122
Power generation	2211
Printing and publishing	3231 and 511
Water and wastewater treatment	2213
Wood industries	3211 to 3219 and 3371 to 3379

Phase 2 Facilities

→ These facilities first reported in 2012 for their data collected in 2011. They must file their second report by June 30, 2013. They must continue to report their data every year by June 30 for the previous year's data.

Phase 2 Facilities by Industrial Sector	NAICS code
Automotive repair & maintenance	8111
Chemical wholesale	4184
Dry cleaning & laundry services	8123
Funeral services	8122
Medical & diagnostic services	6215
Waste management & remediation services	5621 to 5629

Phase 3 Facilities

→ These facilities need to track amounts of priority substances released, manufactured, processed or otherwise used during 2012 and submit their first report by June 30 of 2013. They must continue to report their data every year by June 30 for the previous year's data.

Phase 3 Facilities by Industrial Sector	NAICS code
Other sectors not exempt under the bylaw	Includes, but not only 313, 315, 331 to 339, 488, 811, 8121

¹ NAICS = North American Industry Classification System. The NAICS codes assigned to the business sectors are for information purposes. Businesses may or may not follow the NAICS code shown in the tables. You can find your NAICS code on the [Statistics Canada website](#). Some facilities that have many processes may have a primary NAICS code and secondary NAICS code: for ChemTRAC reporting, please use your primary NAICS code.

3.0 Reportable Priority Substances

The Environmental Reporting and Disclosure Bylaw lists 25 priority substances as shown in Figure 3.1. These substances are in the bylaw because they are in Toronto's environment at levels that may have adverse impact on human health. To find out more about the health effects of these toxic chemicals, visit www.toronto.ca/chemtrac.

Figure 3.1: Priority Substances and Reporting Thresholds

Chemical	CAS No. ^a	Mass reporting threshold (kg/yr)	Concentration threshold (% w/w)
Group A			
Acetaldehyde	75-07-0	100	1.0
Acrolein	107-02-8	100	1.0
Benzene	71-43-2	100	1.0
1,3-Butadiene	106-99-0	100	1.0
Cadmium ^b	-	1.0	1.0
Carbon tetrachloride	56-23-5	100	1.0
Chloroform (Trichloromethane)	67-66-3	100	1.0
Chromium, Hexavalent ^b	-	10	1.0
Chromium, Non-hexavalent ^b	-	100	1.0
1,2-Dibromoethane (Ethylene dibromide)	106-93-4	100	1.0
1,4-Dichlorobenzene	106-46-7	100	1.0
1,2-Dichloroethane (Ethylene dichloride)	107-06-2	100	1.0
Dichloromethane (Methylene chloride)	75-09-2	100	1.0
Formaldehyde	50-00-0	100	1.0
Lead ^b	-	10	0.1
Manganese ^b	-	10	1.0
Mercury ^b	-	1.0	0.0
Nickel ^b	-	100	1.0
Tetrachloroethylene (Perchloroethylene)	127-18-4	100	1.0
Trichloroethylene	079-01-6	100	1.0
Vinyl chloride	75-01-4	100	1.0
Group B			
Polycyclic aromatic hydrocarbons (PAHs)	-	10	n/a ^c
Group C			
Nitrogen oxides ^d (NO _x)	11104-93-1	200	n/a
Particulate matter 2.5 micrometres or less in diameter (PM _{2.5})	-	30	n/a
Volatile organic compounds (VOCs), total	-	100	n/a

- a. Chemical Abstracts Service Registry Number
- b. and its compounds expressed as the metal
- c. n/a = not applicable
- d. NO + NO₂, expressed as NO₂

3.1 What are the reporting thresholds?

The Environmental Reporting and Disclosure bylaw lists the reporting thresholds for the 25 priority substances (see Figure 3.2). The "Mass Reporting Thresholds" amounts are compared to the amounts released, manufactured, processed or otherwise used.

When a priority substance is part of a mixture or material, if it is found in a concentration below the "Concentration Threshold", then it does not need to be considered in the calculations.

If your facility meets or exceeds both the Mass Reporting Threshold and Concentration Threshold (where applicable) for any of the priority substances listed in the bylaw you are required to submit a report of the substances. For example, your facility uses 10 different substances, but only 3 substances meet the thresholds listed in the bylaw. You are, therefore, required to report on the 3 substances that have met/exceeded the thresholds.

3.2 What are chemical groups?

The priority substances listed in the Environmental Reporting and Disclosure Bylaw are divided into three groups because the reporting thresholds are calculated differently for each of the groups:

- **Group A** are the priority substances where the reporting threshold is determined by adding the amounts of the chemical manufactured (including any by-product created), processed and otherwise used.
- **Group B** refers to polycyclic aromatic hydrocarbons (PAHs, see Appendix 3). The reporting threshold for PAHs is the combined, total amount of all PAHs your facility released, disposed and/or transferred for recycling.
- **Group C** includes NO_x, PM_{2.5} and VOCs. The reporting threshold for these substances takes into account only the amounts released to air. See Appendix 4 for more details.

3.3 How do I know if I manufacture, use or release any priority substances?

If you intentionally manufacture, process or use one of the priority substances, then it is simple to determine if the amounts are equal to or greater than the reporting thresholds. It is also possible that you process or use a material that contains one of the reportable chemicals or create the chemicals as a by-product. To help you identify these, there are many sources of information to help you, including:

- Material Safety Data Sheets (MSDS)
These sheets list the ingredients in a product along with the concentration of the chemicals in the product. They are available from product suppliers.
Note: If the MSDS lists a range of percentages for a substance, then use the average percent (mean %) when using it in any calculation.

For example, if an MSDS says that a product contains 30-40% of a substance (see Figure 3.3, you should use 35% for your calculations unless you have more specific information.

Figure 3.3: Example of a MSDS sheet with a range of chemical content

Material Safety Data Sheet (MSDS): Formaldehyde

Section 1: Product Identification			
Product name:	FORMALDEHYDE		
Chemical formula:	N/A		
Synonyms:	Methylene oxide, AC-4553, AC-4554, 41860, 41883		
Supplier:	Chemicals LTD 123 Anywhere St. Ottawa, ON K5R 8N9		
Material uses:	For laboratory use only.		
Section 2: Hazardous Ingredients			
Name	CAS #	%	TLV
1. Formaldehyde	50-00-0	30 – 40	Exposure limits: 0.3 ppm (0.37mg/m ³)
2. Methanol	67-56-1	5 – 15	Exposure limits: 200 ppm (262mg/m ³)
3. Water	7732-18-5	Balance	N/A
Section 3: Physical Data			
Physical state	Clear, colourless liquid with strong formaldehyde odour.		
pH	2.8 – 4.0 (25 degrees Celsius) (37% solution)		
Odour threshold	0.8 – 1ppm		
Percent volatile	100%(V/V)		
Freezing point	Insoluble polymer gradually forms.		
Boiling point	90 - 100		
Specific gravity	1.08 to 1.0975 (Water = 1)		
Vapour pressure	~40 mm of Hg (@ 39°C)		
Vapour density	0.62 to 1.04 (Air = 1)		
Evaporation rate	2.1(n-Butyl acetate = 1) (Methanol).		
Solubility	Miscible in water.		
Section 4: Fire and Explosion Data			
Flash point	50 – 78 degrees Celsius		
Flammability	Lower: 7%; Upper: 73%		
Fire extinguishing procedures	Use DRY chemical, carbon dioxide, alcohol-resistant foam or water spray. Cool containing vessels with flooding quantities of water until well after fire is out.		
Section 5: Reactivity Data			
Stability	Stable. Conditions to avoid: heat, sparks and flame, temperatures below 20°C		

- Operating Permit, Certificate of Approval or Environmental Compliance Approval (if present)
These may identify the substances you may release to the environment.
- Pollution prevention and industry guides for your processes
These should indicate the chemicals that are typically used or released.
- ChemTRAC Calculators
These help you estimate and quantify the chemicals used and released from many industrial processes and were developed by Toronto Public Health for the ChemTRAC program. You may find calculators that apply to your business. See http://www.toronto.ca/health/chemtrac/business_resources.htm for the list of calculators (under Industry Information & Tools).

4.0 Reporting criteria

Businesses in the City of Toronto are required to report to ChemTRAC if they release or manufacture, process or otherwise use (depending in which Group the substance is classified) any of the priority substances listed in the Environmental Reporting and Disclosure Bylaw in amounts equal to or above the reporting thresholds.

Examples of facilities that may release, manufacture, process, or otherwise use one or more of the chemicals listed in the bylaw include:

- food and beverage manufacturing
- clothing manufacturing
- printing and publishing
- chemical manufacturing
- wood industries
- chemical distribution
- medical and diagnostic laboratories
- vehicle repair (e.g. body work and painting)
- laundry services, including dry cleaning
- funeral services

4.1 Exempt facilities and businesses

The following types of facilities are exempt from the bylaw and are **NOT** required to report:

- facilities engaged solely in retail sales
- medical or dental offices
- construction and building maintenance sites
- food and accommodation services, except for laundry and dry cleaning facilities located within the facility
- facilities that distribute, store or sell fuels
- facilities that maintain and repair vehicles (for example cars, trucks, locomotives, ships or aircraft). However, painting or stripping of vehicles or their components, rebuilding or remanufacturing vehicle components (for example, engines, landing gear, traction motors) are not exempt from the bylaw.

Appendix 1 gives a more detailed description of the types of facilities that do not need to report.

4.2 Exempt sources of chemicals

The ChemTRAC priority substances may come from many different sources within a facility. Some of these sources are exempt from the bylaw and do not need to be included in any calculations for reporting. Figure 4.1 summarize the sources that are exempt in the bylaw.

Figure 4.1: Chemical Sources Exempt from the Bylaw

Exempt source	Example
An article (an item that already contained a priority substance before it entered your facility and that doesn't release any of the chemical when it is used or processed)	A tool or part of a machine
A structural component of a facility	A wall or floor
A product used for routine cleaning, facility and grounds upkeep	Washroom sanitizer
Personal items of the people in the facility	Hairspray
Vehicle emissions	Dump truck emissions
Intake water or air	Compressed air, cooling water
Road dust	Dust created by the movement of vehicles
Emissions from space heaters or hot water heaters that are not part of the process equipment	Emissions from a furnace or water boiler generated to heat a building only. NOTE: If the hot air or water is used in a manufacturing process it is not exempt.
Materials used for activities involving routine and preventative maintenance of motor vehicles operated by the facility. This does NOT include repairs such as welding and body work.	Motor oil, lubrication materials cleaning, replacement of lubricants/fluids

See Appendix 2 for a more detailed description of source exemptions.

5.0 Estimating amounts released, manufactured, processed and otherwise used

Once you have identified the chemicals in your facility you need to estimate the amounts of those chemicals that you use and release. You can do this in a number of ways. For example, you can use the free ChemTRAC calculators, and their guides, available at www.toronto.ca/chemtrac.

Appendix 5 describes this and other methods for the estimation of these amounts.

Once you have calculated the amounts of the chemicals, then compare these amounts with the reporting threshold for each chemical. If any amount of a priority substance is equal to or more than the threshold listed in the Environmental Reporting and Disclosure Bylaw then you are required to submit a report.

Example: Getting ready to report

ABCD Cleaners is a dry cleaning facility in Toronto. This type of facility is not exempt from the bylaw. The owner needs to check if the facility released, manufactured, processed or otherwise used any priority substances in amounts equal to or above the reporting thresholds. To do this, the owner decides to use a ChemTRAC calculator. Using 2012 records, the owner collects the data needed to use the calculator.

Using the ChemTRAC calculator for the dry cleaning sector, the owner finds that in 2012 the facility released 98 kg of total VOCs. The reporting threshold for total VOCs is 100kg/yr.

They do not have to report their 2012 data because they are below the reporting threshold. The owner decides to go into the reporting system and report that the facility is below the threshold.

Because the facility is so close to the threshold, the owner decides to review the data in 2013 and in future years to determine each year if they have to report.

Along with the ChemTRAC resources, you can get help from other sources including:

- NPRI toolbox <http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=65A75CDF-1>
- U.S. EPA Emission factor collection <http://www.epa.gov/ttnchie1/ap42/>
- Australian NPI Emission Estimation Manuals <http://www.npi.gov.au/publications/emission-estimation-technique/index.html>
- Industry Associations
- Your product suppliers

Note: Links to other government programs are provided for your convenience to assist in estimating chemicals. Regulatory guidance that may appear in these guides is not applicable to Toronto's Environmental Reporting and Disclosure Bylaw.

6.0 What information do I report?

There are three types of information you will need to report to the City of Toronto:

- Facility information
- Priority substance (chemical) information
- Pollution prevention actions taken, if any

6.1 Facility information

The first step in reporting is to provide information about your facility.

Each facility that reports to ChemTRAC must include:

- name and address of the facility
- number of employees
- nature of the facility's business (by [North American industry Classification \(NAICS\) code](#))
- contact information

Every facility in Toronto that meets or exceeds the thresholds of the priority substances listed in the bylaw must report every year. A company that owns several facilities must submit a report for each facility individually.

6.2 Priority Substances information

You need to choose from the list of 25 priority substances those that you are going to report.

For all the substances that you have to report, you need to provide the yearly amounts (*in kilograms*) that you:

- manufactured
- processed
- otherwise used
- released to air (fugitive and direct emissions)
- released to surface water (spills and discharges)
- released to land (spills and on-site disposal)

Also, for each one of these quantities, you need to indicate the methods used for the calculations.

You can also provide additional information that may help the City understand your substance data.

6.3 Additional information

In addition to the information required by the bylaw, you are encouraged to provide information about your facility's environmental programs and achievements. This option is available to all facilities, even those who are not required. This information can help the community better understand your facility's environmental performance.

7.0 How to Report

Facilities must submit chemical and facility information using the ChemTRAC Online Reporting System. You can access the system at www.toronto.ca/chemtrac. If you don't have a computer you can use one at any public library (torontopubliclibrary.ca) or request the form to report on paper (call 311).

For security, first time users will need a "First Time Access Code" to use the system. The City sends businesses their First Time Access Code by mail. If you did not receive or have lost your First Time Access Code, please call 311.

Once you are registered, the system will guide you through the steps that you are required to take in order to complete your report.

For those businesses or facilities that are not required to report, the online reporting system allows you to inform us if you are exempt from the bylaw or under the reporting thresholds. This information is valuable to assist us with the administration of the bylaw and to keep you informed on ChemTRAC program initiatives.

Once you register you will get an unique Registration ID. This is your password to log in to the system. You will need to use this ID, instead of the First Time Access Code, to log in again. If you forget or lose your Registration ID, please call 416-338-7600.

The deadline for reporting is June 30th of each year.

7.1 Reporting Checklist

Here is a checklist to help make reporting easier.

- Enter complete facility and contact information. If you are a consultant, identify yourself as the technical contact.
- Submit a **separate** report for **each** facility in Toronto.
- Complete the statement of certification.
- Report **all** the priority substances (chemicals) that meet or exceed (equal to or greater than) the reporting thresholds.
- Report **both use and release** amounts of all priority substances that meet or exceed the reporting thresholds.
- Estimate use and release for **all** sources and processes in your facility.

- This includes process such as heating by natural gas combustion, welding, equipment cleaning, drilling, grinding, crushing, sanding, and blending.
- Review the exemptions in the bylaw, such as building heating, and do not include these in your calculations.
- Compare current year estimates with that of previous years (if available) and explain any differences if present.
- If you report to NPRI and there is a difference between the amount of a substance reported to ChemTRAC and NPRI, explain the reason for the difference.
- You may need to make your records available for audit purposes. Securely store the records you based your report on and document:
 - Assumptions and parameters used for calculations
 - Procedures and methods used to measure emissions
 - Calibration records of any equipment used to measure emissions

Use and Release Calculations

- There are many sources of information that can help you identify the priority substances in your facility. Be sure to check all of them, including:
 - Purchase records
 - Raw materials
 - Certificate of Approval or Environmental Compliance Approval
 - Material Safety Data Sheets
 - Year-end inventory
 - Correspondence with supplier
- Purchase records
- Use the best available method for use and release estimation. The most appropriate and most recent ChemTRAC calculator can be found at toronto.ca/health/chemtrac/tools.htm.
- Enter all the reportable data in kilograms (kg).
- Calculate the **total** amount of a substance used and released in **all** processes.
 - For example, process 1 used 90 kg VOC and released 75 kg. Process 2 used 60 kg VOC and released 56 kg. The total amount of use would be $90+60=150$ kg and release $75+56=131$ kg.
 - To help with these calculations you can use the free online ChemTRAC totals calculator.
- Double check that **decimal places** are entered in the correct place (e.g. 3.47 vs. 347)
- Use the **average value** for use and release estimation if the substance content is listed in a range (e.g. 10-12% VOCs) on Material Data Safety Sheets or on other sources of substance data.
- The following priority substances are VOCs. Be sure to report them separately **and also include** them in your VOC estimation:

Acetaldehyde	Acrolein	Benzene
1,3-butadiene	Carbon Tetrachloride	Chloroform
1,4-Dichlorobenzene	1,2-Dichloroethane	Formaldehyde
Trichloroethylene	Vinyl chloride	Polycyclic Aromatic Hydrocarbons (PAHs)

- Consider the effects of pollution control devices (e.g. filter) in the emission calculations.
- Consider the amount of waste transferred off-site (if any) in emission calculations.

Disclaimer: This checklist is for information only. The City of Toronto assumes no liability for accuracy or completeness. Readers are responsible for ensuring compliance with Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423). This information should not be relied upon as a substitute for legal or professional advice. Readers should seek their own legal or professional advice in regard to their use of the information contained in it.

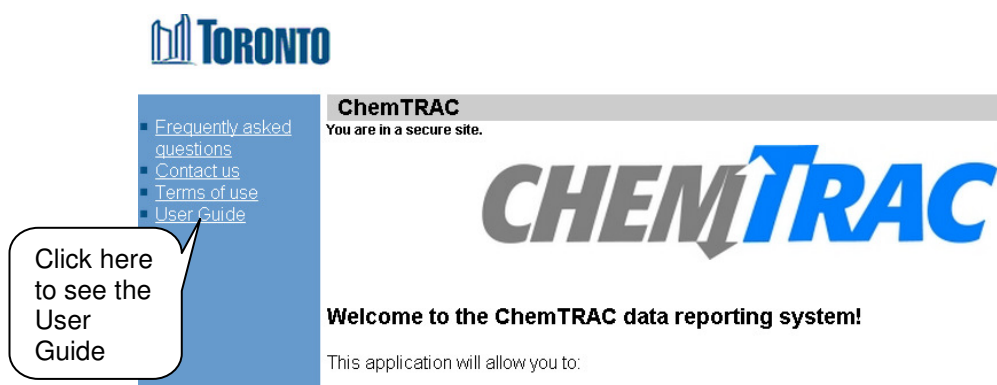
7.2 Reporting Online

This section describes how to use the ChemTRAC's online reporting system.

Once you are ready to report, you need to access the online reporting system.

To access the system:

1. Open the ChemTRAC web page: www.toronto.ca/chemtrac
2. Click on "Ready to Report" located at the bottom right of the home page then
3. Click on the "Go to ChemTRAC Online Reporting" and you will be directed to the data reporting system. At any time, you can consult the "User Guide" by clicking the link located at the bottom of the left navigation bar as shown below.



4. To proceed, you must read and agree to the 'Terms of Use' by clicking the 'I Agree' button at the bottom of the page. This will take you to the log in page.
5. Logging in: As mentioned earlier, if this is your first time accessing the system you will need to register your facility by using the First Time Access Code. If you are already registered and need to make changes or add chemical information you will need to enter your Registration ID. The City sends businesses their First Time Access Code by mail. If you did not receive or have lost your First Time Access Code, please call 311. Once you have entered the first time access code click the Go button at the bottom of the page and you will be taken to *Step 1* (facility registration). At this step you must register your facility by providing information as required.

Step 1: Facility Registration

Facility information

You need to enter your facility information in the fields as shown below. Required fields are indicated by **bold, coloured** text.

Facility Information
Facility Name:
Facility Phone:
(e.g. 416-338-7387)
Facility Fax:
No. of Employees:
Web Site:
Address:
(e.g. 123 Main St. W.)
Unit:
City: *Toronto*
Postal Code:
(e.g. M5B 1W2)

Type of Facility

Please indicate your main type of business by selecting the North American Industry Classification System (NAICS) code that best applies to your facility. If more than one code applies to your facility, select the one that captures the majority of the activities in your facility. You must select the 2-Digit NAICS code first from the drop down list right beside "NAICS 2-Digit" as shown in the figure below. After that you select the 4-digit NAICS code followed by 6-digit NAICS code. If you are not sure of your NAICS code click on "[NAICS Code Help](#)" to find your code as shown below.

Please select the first two digits of your NAICS code, then the first four digits, then the full 6-digit code. Not sure of your NAICS Code? Click this link, [NAICS Code Help](#), to search for your code.

NAICS 2-Digit:
NAICS 4-Digit:
NAICS 6-Digit:

Click the arrows to select your NAICS code

Company Contact Information

In this section you need to provide the name, title and contact information of the person that should be contacted by the ChemTRAC team if necessary. The Company Contact will be listed with the Facility Information on the City's web site.

Owner/Corporate Officer Contact Information

In this section you need to provide the name, title and contact information of the owner or corporate officer only if this is different from the Company Contact. This Information will not be listed on the City's web site. To enter the Owner/Corporate Officer Contact information, click the box provided to enter the information as shown below.

Owner/Corporate Officer Contact Information

The Owner/Corporate Officer Contact will **not** be listed on the City's web site.
This is an additional contact, who would only be contacted by City staff regarding submitted data.

Click here if the Owner Contact is different from the Company Contact

Click to enter Contact info

First Name:

Last Name:

Job Title:

Phone:

Ext:

Fax:

Email:

Technical Contact Information

You need to provide the Technical Contact information only if this is different from the Company Contact. This information will be used only when the City needs clarification of the submitted data. The Technical Contact will not be listed on the City's website. To enter the Technical Contact information, click the box provided to enter the information as shown below.

Click here if the Technical Contact is different from the Company Contact

Click to enter Technical Contact info

First Name:

Last Name:

Job Title:

Phone:

Ext:

Fax:

Email:

Comments

In this part you can provide any additional comments about your facility. For example, explain recent changes in your operations, latest upgrades in technology, etc.

Step 2: Reporting Period

- As shown in the figure below, this section allows you to indicate whether you:
 - want to proceed to file your report for the year you selected.

- revising information you previously submitted.
- do not meet reporting thresholds for the selected year.
- are not required to report according to the bylaw.
- are only registering facility information this time.

Reporting Period

Please select the year for which you are providing information:

I am ready to report for the year above:

- I meet the reporting requirements and I am providing data
- I am revising information I previously submitted
- I do not meet reporting thresholds
- I am not required to report, according to Section 423-3 of the Environmental Reporting and Disclosure Bylaw
- I am only registering my facility information at this time

- If you select either of the first two options to report chemical use and release or update chemical information you have previously reported the application will take you to STEP 3 (Chemical Selection).
- If you select any of the last three options, the application will take you directly to STEP 5. The system will still give you the opportunity to enter an environmental-related comment in the "Environmental Statement" section. This information may help the community to better understand your facility and/or environmental practices.
- If you cancel at this stage, no information will be saved.

Step 3: Chemical Selection

- This section allows you to select the chemical(s) you will be reporting on. It is best to have your data ready for all the chemicals you need to report on. If you re-enter the system to update previously submitted chemical data for one reporting year you will need to re-submit all the data for each chemical for that same year.
- You may select multiple chemicals by clicking the boxes associated with each chemical. You must select at least one chemical to continue.
- Once you have selected the chemicals that you will report on in this session, go to the bottom of the page and select the "NEXT" button to continue.
- You may return to the application at any time to update previously selected chemicals or enter new chemicals you wish to report.

Note: You may return to the application at a later date before June 30, to update previously submitted information, or enter new quantities and estimation methods.

Caution: If you update previously submitted chemical data for one reporting year you will need to re-submit all the data for each chemical for that same year.

Click the check boxes to select chemicals

CAS Number	Chemical
<input type="checkbox"/> 75-07-0	Acetaldehyde
<input type="checkbox"/> 107-02-8	Acrolein
<input type="checkbox"/> 71-43-2	Benzene
<input type="checkbox"/> 106-99-0	1,3-Butadiene

Step 4: Chemical Use and Release

- This section allows you to enter the amount of a chemical you manufactured, processed, otherwise used and also the amounts released to air, land, water for each one you selected. A new page will be displayed for each selected in Step 3.
- Appendix 6 gives examples of reporting various chemicals.
- Click the quantity column and enter the appropriate number **in kilograms (kg)**. Please only use whole numbers. If you have a value with a decimal place, e.g. 114.3, then enter 114 (use standard rounding rules), if your value is 114.5 then enter 115. Click or use the Tab key on your keyboard to navigate to the Estimation Method field. Click on the arrow on the right side of the field and select the estimation method that you used to determine the quantity. You must select an estimation method to continue.

Caution: The report you are about to submit will replace all of the data you have submitted previously for the same reporting year. This means you must re-enter all the data for each chemical you are reporting.

Benzene
(Reporting Threshold = 100.0 kg)

	Quantity (kg)	Estimation Method
If you used more than one method to estimate data, please choose the main one		
Manufactured:	<input type="text"/>	- Select Estimation Method From List -
Processed:	<input type="text"/>	- Select Estimation Method From List -
Otherwise Used:	<input type="text"/>	- Select Estimation Method From List -
Total Use:	0	
Release to Air:	<input type="text"/>	- Select Estimation Method From List -
Release to Land:	<input type="text"/>	- Select Estimation Method From List -
Release to Surface Water:	<input type="text"/>	- Select Estimation Method From List -
Total Release:	0	

Enter amounts here

Reporting to NPRI

Did you submit a report for this Chemical to the National Pollutant Release Inventory(NPRI)? If you are not sure, select No. Yes No

- You are not required to complete all rows. You will need to enter at least one quantity with the Estimation Method to continue.
- You may choose to "CANCEL". If you do, none of the information from this session will be saved or submitted to the City.
- If you need to change your selection of chemical, you can choose "BACK" to reselect the chemicals you wish to report on.
- By selecting "NEXT" you continue to the next chemical you have selected. Once you have entered the information for all the selected chemicals, the system will take you to STEP 5 (Environmental Statement).
- You may return to the application at a later date, before June 30, to update previously submitted information, or enter new quantities and estimation methods. If you re-enter the system to update previously submitted chemical data for one reporting year you will need to re-submit all the data for each chemical for that same year.
- You are also required to indicate if you report this chemical to National Pollutant Release Inventory (NPRI)

Step 5: Environmental Statement

- It is optional to provide information in this section. There are two parts in this section:
 - The first is a text box where you can include an environmental statement of up to 4,000 characters.
 - In the second part you can indicate if you have done any environmental education or training activities along with any pollution prevention actions taken in your facility.
- This statement will be posted on our website, along with your facility information. The purpose of the statement is to tell the public about any efforts you make to green your business, such as reducing the amounts of chemicals you use and release. An example of an effective environmental statement would be "We use renewable energy as a power source for process heaters".
- This information may help the community to better understand your environmental practices.
- You can enter environmental information even if you do not report any chemicals.
- If you do not wish to enter any information in this step at this time, leave the fields blank and select the "NEXT" button at the bottom of the page.

For the current reporting year, select all the items, below, that you've completed:

Environmental education/training courses Yes No No Change

ChemTRAC elearning module(s) Yes No No Change

If so, which module(s):

Created a Pollution Prevention Plan Yes No No Change

Adopted an Environmental Management System or equivalent Yes No No Change

Other (please describe):

Click the buttons to select any applicable items.

Step 6: Summary Notification

Submit Information

- This step allows you to review the information you have entered in the previous steps. Check that all information is correct.
- If you have made an error, you can click the "BACK" button at the bottom of the screen until you have returned to the step where you wish to correct your information.
- Once you have made your changes, select the "NEXT" button at the bottom of each page until you return to STEP 6 (Summary Notification). The Summary Information will show you the corrected information.
- **CAUTION: If you cancel or exit the system before submitting, your information will not be saved.**
- To submit your information click on the "NEXT" button at the bottom of the page.

Your Name

- In this section you are required to enter the name and title of the person submitting the current information. The Company Contact, that you previously entered, will be the default Submitter. If this is not the case, select "Technical Contact" or "Other" to change the information of the Submitter (see figure below).


If you are not the Company or Technical Contact, please select Other and provide your data here

Company Contact Technical Contact Other

First Name:

Last Name:

Job Title:



Click to change
the submitter
information

Comments

You may wish to include some comments regarding the data you entered or any additional information you would like the ChemTRAC program to know. You can enter these remarks in the text box provided (maximum 256 characters). The information provided in this comments text box **will not** be shown on ChemTRAC's website.

Statement of Certification

You must certify that all the information you are about to submit is true, accurate and complete.

Statement of Certification

- I hereby declare that the information provided is true, accurate and complete.

Step 7: ChemTRAC Report

- The ChemTRAC Report will display the information you submitted in this session.
- The ChemTRAC Report displays your unique **Registration ID** number. Please record this number as you will need to
 - Correct your last report

- File your report in the following years
- If you log into the reporting system again, using your new Registration ID number, STEP 1 (Facility Registration) will not be shown. For any updates to your Facility Information, please contact us at 416-338-7600.
- Please do not use the First Time Access Code again since doing so will generate a new facility in the system instead of displaying your facility.
- The ChemTRAC Report will display a confirmation code that assures you that the information you submitted in this session has been received.
- Please be sure to print this page (see below), for your records by selecting the "PRINT" button at the bottom of the page


ChemTRAC Report

Thank you for submitting your information.
Please print this page for your records.

Registration Information

Until June 30th, you can use this Registration ID at any time to change or add new information:

REGISTRATION ID: R-0002395934-6726CC



This is your
unique
registration id

Modifying your submitted report

- Until June 30th, you can make multiple submissions to the City to change or add to the information you have previously submitted.
CAUTION: New information will replace previously submitted information

Appendix 1: Types of facilities exempt from reporting

The Environmental Reporting and Disclosure Bylaw does **not** apply to some types of facilities:

Facilities engaged solely in retail sales

The retail sector (NAICS code 44 and 45) is involved in selling merchandise only and does not change or alter the merchandise. Retail sale is the final step in the distribution of merchandise, which means that retailers receive merchandise and sell it as it was received. Included in this category are retail bakeries primarily engaged in manufacturing bakery products for retail sale (NAICS code 311811) and facilities primarily engaged in retailing confectionery goods and nuts made on the premises (NAICS code 3113) that are sold to the general public on the same premise. Retail paint stores and hardware stores that sell paint (NAICS code 4441) are also exempt from reporting.

If you are a wholesaler or a manufacturer who also sells some of your products directly to the consumer, you are **not** exempt from reporting.

Medical or dental offices

This sector consists of facilities that provide out-patient health services. The offices of physicians (NAICS 6211), dentists (NAICS 6212), and other health care providers such as chiropractors, optometrists, mental health practitioners, occupational therapists (NAICS 6213), and out-patient care centres (NAICS 6214) do not have to report. Medical and diagnostic laboratories (NAICS 6215) and hospitals (NAICS 622) are **not** exempt from reporting.

Construction and building maintenance sites

Facilities involved solely in construction, building maintenance and renovation activities are exempt from reporting.

Food and accommodation services

A hotel, bed and breakfast, catering business, restaurant, coffee shop, bar, mobile food vending, long-term care facility or traveller accommodation (NAICS code 7211, 7221, 7222, 7223, or 7224) are exempt from the bylaw and do not have to report. However, laundry and dry cleaning facilities located within any of these facilities are **not** exempt from reporting (NAICS code 8123).

Facilities that distribute, store or sell fuels

Gasoline stations (NAICS code 4471) and other facilities that store and distribute fuels (for example, petroleum product distributors, NAICS code 412) are exempt from reporting.

Facilities that maintain and repair vehicles

You do not need to report if your facility only does general mechanical and electrical repair and maintenance services for motor vehicles, such as engine repair and maintenance, exhaust system replacement, transmission repair and electrical system repair, oil change, lubrication, washing, or tire repair. You may need to report if your facility uses large amounts of paints and solvents, for example, if you paint or strip vehicles or their components, rebuild or remanufacture vehicle components. A good

example of this type of facilities is auto body shops that repair and paint vehicles after a collision.

Warehouse and distribution facilities

Facilities that solely store and/or distribute goods do not have to report.

Appendix 2: Exempt sources of priority substances

Some sources of chemicals do not need to be included when reporting under the Environmental Reporting and Disclosure Bylaw. This means that the chemicals from these sources are **not** included in any of your calculations. If the only sources of reportable chemicals in your facility are from such sources, then you do not need to report to ChemTRAC.

An article

An article is a manufactured item that does not release any priority substance when it is processed or used. A tool or mechanical part is considered to be an article. Therefore, any priority substances that are present in an article are not included in any of your calculations. For example, if you use a tool made of a metal alloy that includes chromium, you do not include the amount of chromium in this tool in any of your calculations. If your facility manufactures a tool with an alloy that contains chromium, then you must include the amount of chromium in the tool in your calculations.

A structural component of a facility

Any priority substance present in the material that makes up the structure of the building, such as walls and floors are not included in the calculations.

A product used for routine janitorial, facility building or grounds maintenance

Cleaners, fertilizers, paints, are examples of products that could be used as part of regular cleaning and maintenance of buildings in your facility or the grounds of your facility. Do not include the chemicals found in these substances in any of your calculations. However, chemicals used in cleaning process equipment must be included.

Personal items used by persons at a facility

Any reportable chemical found in personal products used by staff and visitors, such as hairspray and perfume, are exempt from the bylaw.

Emissions from vehicles

Emissions from the vehicles at your facility do not need to be included in any calculations. A vehicle is defined as any mobile equipment with a motor that is used to move equipment, including, loaders, dump trucks, forklifts, excavators and bulldozers. Please note that mobile equipment is not the same as portable. **Portable equipment** can be moved from one place to another but do not have a motor to carry out the movement. If the other criteria of the bylaw are met, you would have to include the amount of a priority substance that is associated with the use of a **portable** facility or equipment when you do your calculations and provide data to the City.

Intake water or air

You may use water or air in your process or at the facility, such as water used for process cooling or air used as compressed air or to feed into a combustion process. You do not need to consider any priority substance that may be present in any water or air that you bring into your facility, such as substances found in piped water from the municipal system or pollutants already found in the outdoor air.

Road dust

The movement of vehicles or equipment at your facility might create dust. You do not need to include in your calculations any priority substances found in the road dust.

Emissions from space heaters or hot water heaters

The emissions from fossil fuels used to heat general-use water or to heat your facility are not included in your calculations. The emissions from fossil fuels burned to heat water used in your manufacturing processes or in industrial boilers **must** be included.

Materials used for the purpose of maintaining motor vehicles operated by the facility

You do not need to include in your calculations amounts of priority substances that are used in the mechanical and electrical maintenance of motor vehicles. This includes substances used for oil change, lubrication, washing and tire repair. Repairs such as welding and body work are **not** exempt.

Appendix 3: Polycyclic Aromatic Hydrocarbons (PAHs)

Under the bylaw, polycyclic aromatic hydrocarbons (PAHs) are defined as the chemicals identified in Schedule 1 Part 2 of the National Pollutants Release Inventory (NPRI). The following table lists the compounds in this group as found in the Canada Gazette notice at the time of publication of this document (<http://www.gazette.gc.ca/rp-pr/p1/2010/2010-12-11/html/notice-avis-eng.html#d101>). This list may be updated by Environment Canada. Please check the most recent list at <http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=2CA07E0D-1> when you report.

Facilities do not have to report on each of these individual chemicals listed below. Only the sum total of these chemicals is used in calculations.

List of substances included in PAH calculations

Name	CAS number	Name	CAS number
Acenaphthene	83-32-9	Dibenzo(a, h)pyrene	189-64-0
Acenaphthylene	208-96-8	Dibenzo(a, i) pyrene	189-55-9
Benzo(a)anthracene	56-55-3	Dibenzo(a, l) pyrene	191 -30-0
Benzo(a)phenanthrene	218-01-9	7H-Dibenzo(c,g)carbazole	194-59-2
Benzo(a)pyrene	50-32-8	7,12-Dimethylbenz(a)anthracene	57-97-6
Benzo(b)fluoranthene	205-99-2	Fluoranthene	206-44-0
Benzo(e)pyrene	192-97-2	Fluorene	86-73-7
Benzo(g,h,i)perylene	191-24-2	Indeno(1 ,2,3-c,d)pyrene	193-39-5
Benzo(j)fluoranthene	205-82-3	3-Methylcholanthrene	56-49-5
Benzo(k)fluoranthene	207-08-9	5-Methylchrysene	3697-24-3
Dibenz(a,i)acridine	224-42-0	1 -Nitropyrene	5522-43-0
Dibenzo(a,h)acridine	226-36-8	Perylene	198-55-0
Dibenzo(a, h)anthracene	53-70-3	Phenanthrene	85-01-8
Dibenzo(a,e)fluoranthene	5385-75-1	Pyrene	129-00-0
Dibenzo(a,e)pyrene	192-65-4		

Appendix 4: Volatile Organic Compounds (VOCs)

Volatile organic compounds (VOCs) are a group of almost 1,000 organic substances that volatilize (evaporate) easily. Some VOCs undergo photochemical reactions in the atmosphere and contribute to the formation of particulate matter (PM) and ground-level ozone. High concentrations of ground-level ozone and PM contribute to smog, which affects human health.

There are many industrial and commercial sources of VOCs such as:

- loading and unloading of petroleum products
- petroleum spills
- process venting
- spill remediation
- flaring of untreated natural gas
- evaporative losses from storage tanks
- painting and stripping activities
- degreasing activities
- burning fuel (e.g., oil, wood, coal, natural gas)
- solvents and wood preservatives

The Environmental Reporting and Disclosure Bylaw uses the Canadian Environmental Protection Act (CEPA) definition for VOCs. This is found in Schedule 1 to the Canadian Environmental Protection Act, 1999, section 65 (<http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=24374285-1&offset=14&toc=show#1>). CEPA defines VOCs as: Volatile organic compounds are ones that participate in atmospheric photochemical reactions, excluding the substances listed below:

Substances not considered VOCs

Substance or group of substances <u>not</u> considered VOCs	CAS No.
(a) methane	74-82-8
(b) ethane	74-84-0
(c) methylene chloride (dichloromethane)	75-09-2
(d) 1,1,1-trichloroethane (methyl chloroform)	71-55-6
(e) 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113)	76-13-1
(f) trichlorofluoromethane (CFC-11)	75-69-4
(g) dichlorodifluoromethane (CFC-12)	75-71-8
(h) chlorodifluoromethane (HCFC-22)	75-45-6
(i) trifluoromethane (HFC-23)	75-46-7
(j) 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114)	76-14-2
(k) chloropentafluoroethane (CFC-115)	76-15-3
(l) 1,1,1-trifluoro-2,2-dichloroethane (HCFC-123)	306-83-2
(m) 1,1,1,2-tetrafluoroethane (HFC-134a)	811-97-2

(n) 1,1-dichloro-1-fluoroethane (HCFC-141b)	1717-00-6
(o) 1-chloro-1,1-difluoroethane (HCFC-142b)	75-68-3
(p) 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124)	2837-89-0
(q) pentafluoroethane (HFC-125)	354-33-6
(r) 1,1,2,2-tetrafluoroethane (HFC-134)	359-35-3
(s) 1,1,1-trifluoroethane (HFC-143a)	420-46-2
(t) 1,1-difluoroethane (HFC-152a)	75-37-6
(u) parachlorobenzotrifluoride (PCBTF)	98-56-6
(v) cyclic, branched, or linear completely methylated siloxanes	various
(w) acetone	67-64-1
(x) perchloroethylene (tetrachloroethylene)	127-18-4
(y) 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	422-56-0
(z) 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	507-55-1
(z.1) 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee)	138495-42-8
(z.2) difluoromethane (HFC-32)	75-10-5
(z.3) ethylfluoride (HFC-161)	353-36-6
(z.4) 1,1,1,3,3,3-hexafluoropropane (HFC-236fa)	690-39-1
(z.5) 1,1,2,2,3-pentafluoropropane (HFC-245ca)	679-86-7
(z.6) 1,1,2,3,3-pentafluoropropane (HFC-245ea)	24270-66-4
(z.7) 1,1,1,2,3-pentafluoropropane (HFC-245eb)	431-31-2
(z.8) 1,1,1,3,3-pentafluoropropane (HFC-245fa)	460-73-1
(z.9) 1,1,1,2,3,3-hexafluoropropane (HFC-236ea)	431-63-0
(z.10) 1,1,1,3,3-pentafluorobutane (HFC-365mfc)	406-58-6
(z.11) chlorofluoromethane (HCFC-31)	593-70-4
(z.12) 1-chloro-1-fluoroethane (HCFC-151a)	1615-75-4
(z.13) 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a)	354-23-4
(z.14) 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane (C ₄ F ₉ OCH ₃)	163702-07-6
(z.15) 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane (CF ₃) ₂ CF ₂ OCH ₃)	163702-08-7
(z.16) 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane (C ₄ F ₉ OC ₂ H ₅)	163702-05-4
(z.17) 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane (CF ₃) ₂ CF ₂ OC ₂ H ₅)	163702-06-5
(z.18) methyl acetate	79-20-9
perfluorocarbon compounds that fall into these classes:	
(i) cyclic, branched or linear, completely fluorinated alkanes	various
(ii) cyclic, branched or linear, completely fluorinated ethers with no unsaturations	various
(iii) cyclic, branched or linear, completely fluorinated tertiary amines with no	various

unsaturations, and

(iv) sulphur containing perfluorocarbons with no unsaturations and with sulphur bonds only to carbon and fluorine.

various

This definition doesn't name chemicals that are VOCs, but rather identifies substances that are **not** considered in calculating total VOCs. It is your responsibility to identify the substances that are VOCs when you do your calculations. Below are some examples of chemicals and groups of chemicals that would be considered VOCs under the bylaw.

Some example categories of volatile organic compounds

Category	Example Compounds
Alcohols	Ethanol
	Isopropyl alcohol
	Methanol
Alkanes	n-Butane
	Propane
	Octane
Alkenes	Ethylene
	Propylene
	Isobutene
	trans-2-Pentene
Alkynes	Acetylene
Aromatics	Benzene
	Benzo(a)pyrene
	Fluoranthene
	Toluene
	1,2,4-Trimethylbenzene
	Xylene (all isomers)
Aldehydes	Formaldehyde
	Acetaldehyde
Ketones	Methyl isobutyl ketone
Ethers	Methyl <i>tert</i> -butyl ether
	Tripropylene glycol monomethyl ether
Esters	Dimethyl phthalate
	Dibutyl phthalate

Please note:

- 11 VOCs are listed in the bylaw as individual substances under Group A:

Acetaldehyde
Benzene
Carbon tetrachloride
1,4-Dichlorobenzene
Formaldehyde
Vinyl Chloride

Acrolein
1,3-Butadiene
Chloroform
1,2-Dichloroethane
Trichloroethylene

- PAHs (Group B substances) are also considered VOCs
- You will need to report these Group A and Group B substances separately if your facility meets the criteria for reporting these individual substances
- You must also include these substances, along with all other VOC substances emitted at your facility to calculate the emission of total VOCs during the reporting year

Your estimate for total VOC air emissions must be based on the total mass of all VOC substances released to air at your facility for the year of your report.

Appendix 5: Methods of Estimation

There are several ways you can estimate the amount of a chemical that was manufactured, processed, otherwise used, or released. For the estimates, facilities are expected to use reasonably available information. When you report data to the City, you are required to indicate which estimation method you used. Some examples of methods are:

- Continuous Emission Monitoring Systems (CEMS)
- Predictive Emission Monitoring (PEM)
- Source testing
- Mass balance
- Site-specific emission factor
- Published emission factor
- Engineering estimates

A description of the available estimation methods and some examples are provided below. More detailed explanation of these are provided in Environment Canada's NPRI Toolbox at <http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=65A75CDF-1>

A5.1 Continuous Emission Monitoring Systems

Continuous emission monitoring systems (CEMS) record emissions/releases over an extended and uninterrupted period. Once the contaminant concentration and the flow rate have been determined, release or emission rates can be calculated by multiplying the contaminant concentration by the discharge flow rate or volumetric stack gas flow rate. Annual emissions/releases of the contaminant can then be estimated by multiplying the contaminant concentration by the annual flow rate of the discharged effluent or gases in the stack or duct.

Example: Nitrogen oxides (NO_x) emissions from an oil-fired boiler.

The following example illustrates the estimation of NO_x emissions from an oil-fired boiler that has Continuous Emission Monitoring (CEM).

Step 1 - Obtain the CEM Output

Period	Fuel rate, Q _{fuel} (10 ³ kg/hr)	Stack Gas Flow Rate, Q _{stack} (m ³ /min)	NO _x measured Concentration, C (mg/L)
1:00	15.4	3 576	175
1:10	16.9	3 855	186
1:20	15.3	3 433	155
1:30	16.0	3 720	175
1:40	16.5	3 760	164
1:50	16.3	3 754	158
2:00	16.2	3 825	179

Step 2 - Calculate emissions

The following equation is used to calculate emissions from the measured concentrations:

$$\text{CER}_x = (\text{C}_x \times \text{MW}_x \times \text{Q}_{\text{stack}} \times 60) / (\text{V} \times 10^6)$$

Where:

CER_x = calculated emission rate of contaminant "x", kg/hr

C_x = Concentration of contaminant "x", mg/L

M_x = Molar mass of the contaminant "x", g/mole

$$\text{M}_{\text{NO}_x} = 46 \text{ g/mole (as } \text{M}_{\text{NO}_2}\text{)}$$

Q_{stack} = Dry stack gas volumetric flow rate at reference conditions, m³/min (reference conditions: 101.325 kPa and 25°C)

V = Volume occupied by 1 mole of ideal gas at reference conditions (24.45 litres/mole)

Performing this calculation for every measurement gives the results shown in the following table:

Period	Fuel rate, Q fuel (10 ³ kg/hr)	Stack Gas Flow Rate, Q _{stack} (m ³ /min)	NOx measured Concentration, C (mg/L)	NOx calculated Emission Rate, CER (kg/hr)
1:00	15.4	3,576	175	73
1:10	16.9	3,855	186	81
1:20	15.3	3,433	155	66
1:30	16.0	3,720	175	74
1:40	16.5	3,760	164	77
1:50	16.3	3,754	158	73
2:00	16.2	3,825	179	79
			Average =	75

According to these calculations, the estimated average emission rate of NOx during the time sampled is 75 kg/hr.

A5.2 Predictive Emission Monitoring

Predictive emission monitoring (PEM) is based on developing a correlation between contaminant release/emission rates and process parameters (e.g., fuel usage, steam production, furnace temperature). PEM may be considered a hybrid of continuous monitoring, emission factors and stack tests. A correlation test must first be performed to determine the relationship between contaminant emission rates and process parameters. Releases/emissions can then be calculated or predicted using process parameters to predict release/emission rates based on the results of the initial source test.

Example: Emissions of particulate matter (PM_{2.5}) from a boiler firing heavy fuel oil
Emissions of particulate matter with diameter less or equal to 2.5 micrometres (PM_{2.5}) from a boiler firing heavy fuel oil (HFO) are estimated in this example. To utilize the PEM approach, a model or relationship between PM_{2.5} emission rates and fuel consumption must first be developed. An example of a model relationship is shown below.

Step 1 - Get the PEM Data

Correlate the PM_{2.5} emission rates to the HFO consumption rate of the boiler in the PEM as listed in the table below.

Parameters	PEM data									
HFO consumption rate (GJ/h)	71	72	73	74	75	76	77	78	79	80
PM _{2.5} emission rate (kg/h)	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9

Once the predictive model has been tested and verified it can then be used along with the operation fuel use consumption rate to estimate annual PM_{2.5} emissions from the unit.

The following table illustrates how the predictive model is used to estimate PM_{2.5} emissions for a specific time period.

PEM Monitoring Results		Predicted PM _{2.5}
Time (hr)	Fuel Rate (GJ/hr)	Emission Rate (kg/hr)
1	74	1.7
2	74	1.7
3	76	1.8
4	75	1.7
5	76	1.8
6	77	1.8
7	78	1.8
8	79	1.8
9	80	1.9
10	80	1.9
Total for period	769 GJ/10 hours	17.9 kg/10 hours
Average for period	76.9 GJ/h	1.79 kg/h

Step 2 - Calculate Emissions

The general formula for estimating emissions for contaminant "x" is:

$$E_x = E_{x,ave} \times T$$

Where:

E_x = Emission of contaminant "x", kg/year

$E_{x,ave}$ = Average emission rate of contaminant "x", kg/hr

T = Total operating hours in a given year

Given that the above boiler unit operated under the same condition for 7,500 hours in the year, the estimated PM_{2.5} emissions ($E_{PM2.5}$) would be as follows:

$$E_{PM2.5} = 1.79 \times 7,500 = 13,425 \text{ kg PM}_{2.5} / \text{year} = 13.42 \text{ tonnes per year}$$

A5.3 Source Testing

Source testing involves collecting a sample of the emission or effluent, then determining the concentration of one or more substances in the sample. The concentration of the substance(s) of interest is then multiplied by the volumetric flow rate to determine the amount of the substance(s) emitted/released over time. Source testing of air emissions

generally involves inserting a sampling probe into the stack or duct to collect a volume of exhaust effluent isokinetically. The contaminants collected in or on various media are subsequently analyzed. For liquid effluents, grab samples or 24-hour composite samples are extracted from the effluent stream. Source testing is often conducted as a regulatory requirement for provincial, territorial or regional authorities

Next you will find two examples of this estimation method. These source testing examples are based on measured concentrations of the substance in a waste stream and the volume/flow rate of that stream.

Example 1. Volatile Organic Compounds (VOC) in a painting spray booth.

This example illustrates the use of source test data to estimate process emissions from a paint spray booth. The materials emitted from the spray booth stack are 100% VOC.

Step 1. Identifying Operating Parameters:

Stack flow rate: 30,000 m³/hour
Average measured VOC concentration from stack: 0.002 kg VOC/m³
Spray booth annual operation: 2,000 hours/year

Step 2 - Estimating Emissions

Since source testing provides a VOC concentration and the average stack exhaust flow rate, the concentration can be converted to a mass flow rate:

Mass flow rate = volumetric flow rate x concentration
= 30,000 m³/hour x 0.002 kg VOC/m³
= 60 kg VOC/hour

The annual VOC emissions can be estimated using the mass flow rate and the annual hours of operation for the spray booth:

VOC emissions = mass flow rate x annual hours operation
= 60 kg VOC/hour x 2,000 hours
= 120,000 kg VOC or 120 tonnes

Example 2. Chromium (VI) in a galvanizing facility.

A galvanizing facility discharges its wastewater to a nearby body of water. The electroplater is required to monitor this discharge once a month for various parameters, including the release of chromium (VI). What is the annual release of chromium (VI) to the wastewater by this galvanizer?

Step 1

Gather wastewater flow and concentration data from the monitoring results done in compliance with the municipal by-law for wastewater discharges. Analytical results for chromium (VI) for the year are presented in the table below.

Step 2

Calculate the mass loading for those days on which a chromium (VI) analysis was performed. This is done by multiplying the daily flow by the measured chromium (VI) concentration.

Concentration of Chromium (VI) in Wastewater			
Day	Wastewater Flow (10 ⁶ L/d)	Chromium (VI) Concentration (µg/L)	Chromium (VI) Releases (kg/d)
<i>Jan. 8</i>	1.57	918	1.44
<i>Feb. 12</i>	1.49	700	1.04
<i>Mar. 10</i>	1.58	815	1.28
<i>Apr. 15</i>	1.66	683	1.13
<i>May 9</i>	1.38	787	1.09
<i>June 13</i>	1.29	840	1.08
<i>July 11</i>	1.73	865	1.50
<i>Aug. 10</i>	1.60	643	1.03
<i>Sept. 8</i>	1.75	958	1.68
<i>Oct. 12</i>	1.56	681	1.06
<i>Nov. 10</i>	1.80	680	1.22
<i>Dec. 8</i>	1.63	627	1.02
Average =			1.21

Step 3: Calculate annual releases

Based on an average daily release of 1.21 kg/d over the year and 250 days of discharge during the year, the yearly chromium (VI) discharged to water is:

$$1.21 \text{ kg/d} \times 250 \text{ d/yr} = 302.5 \text{ kg/yr} = 0.303 \text{ tonnes/yr}$$

4.2.4

A5.4 Mass Balance Calculations

A mass balance is an accounting of the quantity of a substance going in and out of an entire facility, process or piece of equipment. Releases can then be calculated as the difference between input and output. Accumulation or depletion of the substance in the equipment should be accounted for in the calculation.

The general equation for a mass balance is:

$$M_{in} = M_{out} + M_{accumulated/depleted}$$

Where:

M_{in} = Mass of compound in the raw material feed

M_{out} = Mass of compound in the finished product and released to air, land and water

$$(M_{out} = M_{product} + M_{emitted})$$

$M_{accumulated/depleted}$ = Mass of compound accumulated or depleted in the system

The reliability of release estimates based on mass balances is dependent on the source type considered. Mass balance methods may be preferred for some releases, such as solvent use and loss. This method may not be suitable for many other sources, such as cases where chemical transformation of input streams occurs.

Pollution control equipment should be accounted for when mass balance calculations are performed.

Example. Electroplating – Using mass balance.

An electroplating facility operates a vapour degreaser. Suppose that 14 tonnes of trichloroethylene are used as a degreasing agent. Spent solvent and sludge that accumulate on the bottom of the degreaser are collected in drums for shipment to an off-site solvent reclaimer. Thirteen drums of solvent were sent to the reclaimer during the past year.

A known volume of a representative sample taken from the drums is weighed, allowed to evaporate, and reweighed. From this, it is determined that the density of the sludge is 1.03 kg/L and that the trichloroethylene concentration in the sludge shipped to the reclaimer is 30%.

Step 1

The entire 14 tonnes of solvent is released from the facility either as an air emission or as a transfer in the sludge. If the quantity of spent solvent shipped to the reclaimer is known, then the quantity transferred can be calculated based on the volume of sludge and the density of the sludge as shown below:

Volume of trichloroethylene to reclaimer

= 13 drums x 210 L/drum = 2 730 L

Mass of trichloroethylene to reclaimer:

= volume of sludge x density of sludge x % trichloroethylene in sludge

= 2 730 L x 1.03 kg/L x 0.30

= 844 kg

= 0.844 tonnes

Step 2

The quantity of trichloroethylene emitted to air can then be calculated by mass balance by subtracting the quantity shipped in sludge to the reclaimer from the quantity purchased:

14 tonnes (purchased) - 0.84 tonnes (to reclaimer) = 13.164 tonnes

Note: In this example, Trichloroethylene is also a VOC. Therefore, this number will be included in the calculation of Total VOCs emissions to air.

A5.5 Site-specific and Published Emission Factors

An emission factor is based on average measured emissions from several similar processes. Emission factors usually express releases as a ratio of quantity released to process or equipment throughput. Emission factors have been published by government agencies and industry associations for application to emission sources in their particular jurisdiction or industrial sector. Industrial facilities may also develop their own site-specific emission factors using emission-testing data and source-activity information. For a particular piece of equipment, specified emission factors may be available from the manufacturer or sales centre. When completing the report, you must specify whether a site-specific emission factor or published emission factor was used.

The basic equations for determining emissions from emission factors are as follows:

$$E_x = BQ \times CEF_x \quad \text{or}$$
$$E_x = BQ \times EF_x \times (100 - CE_x)/100$$

Where:

E_x = Emission of contaminant x in kg

BQ = Activity rate or base quantity (BQ), base quantity unit

CEF_x = Controlled emission factors of contaminant x, in kg/BQ (value is dependent on the external control device installed)

EF_x = Uncontrolled emission factors of contaminant x, in kg/BQ

CE_x = Overall emission control efficiency of contaminant x, %

The FIRE database and the AP-42 are comprehensive repositories of process-specific emission factors. Other emission factors for priority substances can be located using the NPRI's toolbox website.

When making use of emission factors, ensure that you note the units and convert if necessary.

The following examples demonstrate the use of published emission factors:

Example 1. Electroplating – Using published emission factors

Suppose the electroplater previously mentioned has no information about the spent solvent and sludge accumulating on the bottom of the degreaser.

Step 1

In this case, the emission factor is found in a U.S. Environmental Protection Agency publication entitled "Toxic Air Pollutant Emission Factors - A Compilation for Selected Air Toxic Compounds and Sources". For an open-top vapour degreaser without emission control equipment using trichloroethylene (TCE), the emission factor is given as 0.93 tonne/tonne TCE used.

Step 2

Calculate the annual releases to air from the vapour degreaser as follows:

TCE released = TCE used X emission factor (TCE released/tonne used)

14 tonnes X 0.93 tonne/tonne = 13 tonnes

When emission control devices are used, atmospheric releases are estimated by multiplying the "uncontrolled" emission by the quantity $(1 - C/100)$, where C is the control device efficiency. In this example, no emission control devices were mentioned and therefore $C = 0$.

Note: In this example, Trichloroethylene is also a VOC. Therefore, this number will be included in the calculation of Total VOCs emissions to air.

Example 2. Dry cleaning – using published emission factors

Suppose that we need to estimate the amount of Perc (perchloroethylene) emitted by a well-controlled dry cleaning facility. Assume the dry cleaner averages 0.5 tonnes of garments per hour and operates for 1,500 hr/yr.

Step 1

The emission factor is found in a U.S. Environmental Protection Agency publication entitled "Toxic Air Pollutant Emission Factors - A Compilation for Selected Air Toxic Compounds and Sources", in Chapter 4. Evaporation Loss Sources. There are two emission factors provided in the mentioned document, one for typical systems and another for well-controlled systems. For a well-controlled system, the emission factor is given as 3.0 kg Perc/tonne clothes cleaned.

Step 2

Calculate the annual releases to air from the dry cleaner as follows:

Perc released = clothes cleaned x emission factor (Perc released/tonne clothes)

Perc released = 0.5 tonne clothes/hr x 1,500 hr/yr x 3.0 kg Perc/tonne clothes

Perc released = 2,250 kg Perc/yr

Perc released = 2.25 tonnes Perc/yr

As mentioned in the previous example, when emission control devices are used, atmospheric releases are estimated by multiplying the "uncontrolled" emission by the quantity $(1 - C/100)$, where C is the control device efficiency. In this example, the control device efficiency is considered in the emission factor for well-controlled systems that we choose. Therefore, $C = 0$ in our calculation.

A5.6 Engineering Estimates

In many cases, sound engineering assessment is the most appropriate approach to determining process factors and base quantity values. Releases can be estimated from engineering principles and judgment, by using knowledge of the chemical and physical processes involved, the design features of the source and an understanding of the applicable physical and chemical laws. The reliability of these estimates depends on the complexity of the process and the level of understanding of its physical-chemical properties. To apply an engineering assessment method, follow these four basic principles:

Review all data pertaining to the specific source and to the industrial sector in general. Use this data to provide gross approximations and refine these using sound engineering principles as data become available to provide more accurate estimations.

Whenever possible, alternate methods of calculation should be followed to cross-check each level of approximation.

Employ good record keeping by documenting all related information for further emission refinement when more accurate data become available.

Emission Models:

Emission estimation models, also known as emission estimation tools, are equipment-specific and may be available from process developers and designers, government agencies or others.

Emission models generally require detailed input, such as equipment specifications, process and environmental conditions and other factors that affect emissions. Generally, these models also have default input parameters, such as meteorological data, which can be used when site-specific information is not available. Review all the default data carefully to ensure that they apply to local conditions. The resulting estimates should

also be reviewed to ensure their accuracy. The U.S. EPA's TANKS software, used to estimate VOC releases from storage tanks, is an example of an emission model.

A5.7 Sources of Information

There are several sources of manuals, software and data that may be useful in the estimation of the amounts of the bylaw chemicals used or released by a facility. Here are some useful sources of information:

NPRI toolbox

The National Pollutant Release Inventory (NPRI), Environment Canada has compiled a toolbox for facilities at

<http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=65A75CDF-1>

It has example calculations, case studies, and calculation spreadsheets for several processes (mainly for estimation of nitrogen oxides, particulate matter, and polycyclic aromatic hydrocarbons or PAHs). NPRI also provides additional guidance for specific processes such as cooling towers, welding, wastewater, and wood preservation.

U.S. EPA Emission factor collection

The U.S. Environmental Protection Agency has compiled emission factors for a number of toxic chemicals in a database called Factor Information Retrieval (FIRE). WebFire is the Internet version of this resource (<http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main>). In addition, the EPA's Compilation of Air Pollutant Emission Factors, known as AP-42 (<http://www.epa.gov/ttnchie1/ap42/>), provides an overview of an industry's processes, its pollution sources and the control measures to reduce emissions.

Australian NPI Emission Estimation Manuals

The Australian National Pollutant Inventory (NPI) has developed a variety of Emission Estimation Technique Manuals (EETs) for diverse industrial sectors that use or produce priority substances.

(<http://www.npi.gov.au/publications/emission-estimation-technique/index.html>)

Industry Associations

Local, provincial or national industry associations may be able to provide you with tools and other guidance to help identify reportable chemicals your facility uses. They may also be able to help you with calculations.

Permits and Certificates of Approval or Environmental Compliance Approval

Municipal and provincial operating permits and certificates of approval may be another source of information about chemicals at your facility.

Appendix 6: Examples of how to report a priority substance

Example 1: Reporting the manufacture and release of NO_x

In this example, a facility consumed 900,000 m³ of natural gas in 2010 to operate its process equipment. This facility has no emission control devices for natural gas combustion. ChemTRAC calculator (found at www.toronto.ca/chemtrac) calculated that the combustion of this natural gas released 1,442 kg of NO_x as a by-product.

Under the Environmental Reporting and Disclosure Bylaw, creation of a by-product is considered as manufacture. Since there is no emission control device for the combustion process in this example, the quantity of NO_x released (1,442 kg) to air is equal to the quantity of NO_x manufactured.

Therefore in the ChemTRAC report, the facility must enter the amount (1,442 kg) as "Manufactured".

The facility must enter the same amount (1,442 kg) into the "Release To Air" field.

The ChemTRAC report for NO_x for this facility is shown below:

Nitrogen Oxides (NO _x) (Reporting Threshold = 200.0 kg)	
Quantity (kg)	Estimation Method
If you used more than one method to estimate data, please choose the main one	
Manufactured: <input type="text" value="1142"/>	<input type="text" value="ChemTRAC calculator"/>
Processed: <input type="text"/>	<input type="text" value="- Select Estimation Method From List -"/>
Otherwise Used: <input type="text"/>	<input type="text" value="- Select Estimation Method From List -"/>
Total Use: <input type="text" value="1142"/>	
Release to Air: <input type="text" value="1142"/>	<input type="text" value="ChemTRAC calculator"/>
Release to Land: <input type="text"/>	<input type="text" value="- Select Estimation Method From List -"/>
Release to Surface Water: <input type="text"/>	<input type="text" value="- Select Estimation Method From List -"/>
Total Release: <input type="text" value="1142"/>	

If this facility, however did operate an emission control device with 80% efficiency, only 20% of the NO_x manufactured would be released to air. Therefore the amount to enter in the RELEASE section would be 20% of the amount manufactured as shown in the next page.

**Nitrogen Oxides (NO_x)
(Reporting Threshold = 200.0 kg)**

	Quantity (kg)	Estimation Method
If you used more than one method to estimate data, please choose the main one		
Manufactured:	<input type="text" value="1142"/>	ChemTRAC calculator
Processed:	<input type="text"/>	- Select Estimation Method From List -
Otherwise Used:	<input type="text"/>	- Select Estimation Method From List -
Total Use:	1142	
Release to Air:	<input type="text" value="288"/>	ChemTRAC calculator
Release to Land:	<input type="text"/>	- Select Estimation Method From List -
Release to Surface Water:	<input type="text"/>	- Select Estimation Method From List -
Total Release:	288	

Example 2: Reporting the manufacture and release of PM_{2.5}

In this example, a facility released 500 kg of PM_{2.5} in 2010 from the wood sanding process as a by-product. There is no emission control device operated at this facility.

Under the Environmental Reporting and Disclosure Bylaw, the creation of a by-product is considered as manufacture. Since there are no emission control devices for the wood sanding process in this example, the quantity of PM_{2.5} released (500 kg) is equal to the quantity of PM_{2.5} manufactured.

Therefore in the ChemTRAC report, the facility must enter the amount (500 kg) as "Manufactured".

The facility must enter the same amount (500 kg) into the "Release To Air" field.

The ChemTRAC report for PM_{2.5} for this facility is shown below:

**Particulate Matter 2.5 (PM 2.5)
(Reporting Threshold = 30.0 kg)**

	Quantity (kg)	Estimation Method
If you used more than one method to estimate data, please choose the main one		
Manufactured:	<input type="text" value="500"/>	ChemTRAC calculator
Processed:	<input type="text"/>	- Select Estimation Method From List -
Otherwise Used:	<input type="text"/>	- Select Estimation Method From List -
Total Use:	500	
Release to Air:	<input type="text" value="500"/>	ChemTRAC calculator
Release to Land:	<input type="text"/>	- Select Estimation Method From List -
Release to Surface Water:	<input type="text"/>	- Select Estimation Method From List -
Total Release:	500	

Example 3: Reporting the process and release of VOCs

In this example, a facility used 10,000 kg of VOCs as ingredients in the manufacture of perfume in 2010. Source testing method estimated the release of 150 kg VOCs from this facility in 2010.

Since 150 kg of VOCs was released to air from this facility, a ChemTRAC report must be submitted as the reporting threshold for VOCs (100 kg release to air) is exceeded.

The content of the ChemTRAC report must include the quantity of VOCs that is manufactured, processed, otherwise used, and released.

Since 10,000 kg of VOCs was used to manufacture perfume, this quantity must be reported as "Processed" in ChemTRAC report.

The 150 kg of VOCs released from this facility must be reported in the "Release To Air" field.

The ChemTRAC report for VOCs for this facility is shown below:

Volatile Organic Compounds (VOCs) Total (Reporting Threshold = 100.0 kg)	
Quantity (kg)	Estimation Method
If you used more than one method to estimate data, please choose the main one	
Manufactured: <input type="text"/>	- Select Estimation Method From List -
Processed: <input type="text" value="10000"/>	Mass balance
Otherwise Used: <input type="text"/>	- Select Estimation Method From List -
Total Use: <input type="text" value="10000"/>	
Release to Air: <input type="text" value="150"/>	Source testing
Release to Land: <input type="text"/>	- Select Estimation Method From List -
Release to Surface Water: <input type="text"/>	- Select Estimation Method From List -
Total Release: <input type="text" value="150"/>	

Example 4: Reporting the manufacture, process and release of VOCs

In this example, a facility used 10,000 kg of VOCs as ingredients in the manufacture of perfume in 2010. Source testing method estimated the release of 150 kg of VOCs from Stack 1 at this facility in 2010.

The manufacturing process of perfume required the consumption of 500,000 m³ of natural gas, which resulted in the release of 44 kg of VOCs as a by-product from natural gas combustion (calculation completed using ChemTRAC calculator found at www.toronto.ca/chemtrac). The 44 kg of VOCs was released to air from Stack 2.

The total quantity of VOCs released from this facility is determined by combining the emissions from Stack 1 (150 kg) and Stack 2 (44 kg), which is calculated to be (150+44) 194 kg. Therefore, the reporting threshold of VOCs (100 kg release to air) is exceeded, and a ChemTRAC report must be submitted.

The content of the ChemTRAC report must include the quantity of VOCs that is manufactured, processed, otherwise used, and released.

Since 10,000 kg of VOCs was used to manufacture perfume, this quantity must be reported as "Processed" in the ChemTRAC report.

Under the Environmental Reporting and Disclosure Bylaw, the creation of a by-product is considered as manufacture. For the combustion of natural gas, the quantity of VOCs released (44 kg) to air is equal to the quantity of VOCs manufactured.

Therefore in the ChemTRAC report, the facility must enter the amount (44 kg) as "Manufactured".

The facility must enter the amount (194 kg) into the "Release To Air" field.

The ChemTRAC report for VOCs for this facility is shown below:

Volatile Organic Compounds (VOCs) Total (Reporting Threshold = 100.0 kg)	
Quantity (kg)	Estimation Method
If you used more than one method to estimate data, please choose the main one	
Manufactured: i 44	ChemTRAC calculator
Processed: i 10000	Mass balance
Otherwise Used: i	- Select Estimation Method From List -
Total Use: 10044	
Release to Air: i 194	Other
Release to Land: i	- Select Estimation Method From List -
Release to Surface Water: i	- Select Estimation Method From List -
Total Release: 194	